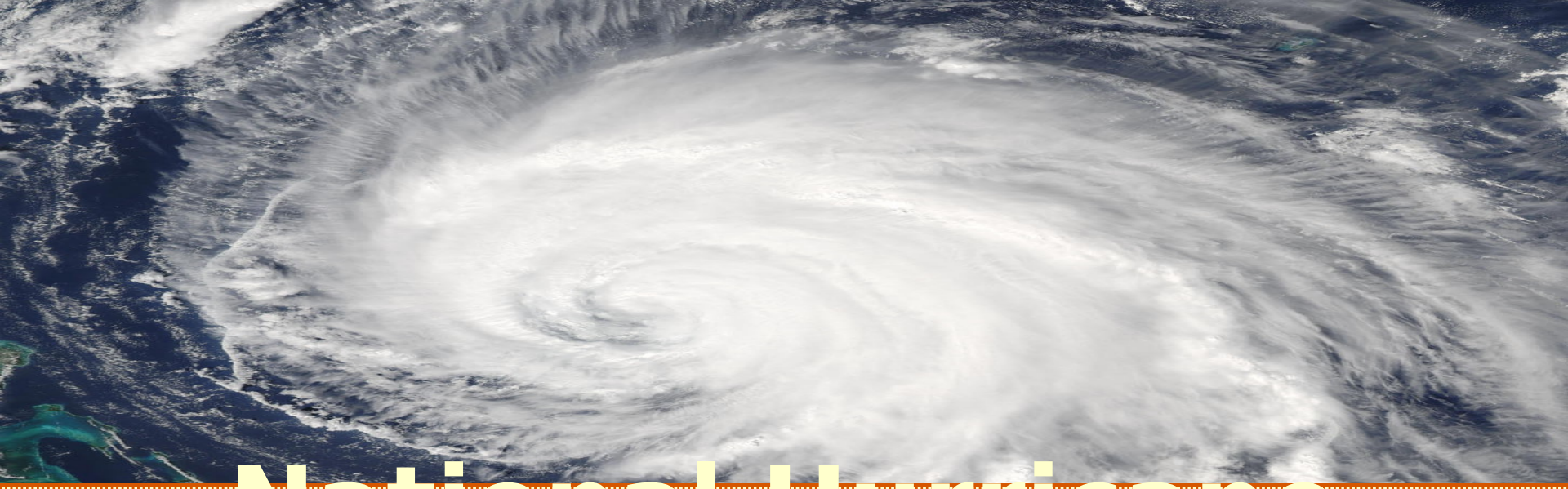


National Hurricane Program

Maryland Western Shore Hurricane Evacuation Study Transportation Tools Workshop

April 2010

FEMA

UNIT 1

Course Overview

Introduction to the MD Western Shore ATM

COURSE OBJECTIVES

Demonstrate a basic understanding of the use of the MD Western Shore ATM

Understand how model outputs or results may be used in HURREVAC

Upon course completion, participants should be able to train other users in the use of the ATM

STUDENT INTRODUCTIONS

Names, job titles, and organizations

Overall experiences with evacuation planning or emergency response

STUDENT EXPECTATIONS

What do you expect to gain from this course?

INSTRUCTOR EXPECTATIONS

Cooperate with the group

Be open minded to new ideas

Participate actively in all of the training activities and exercises

Return to class after beaks at the stated time

Use what you learn to support your organization's role in emergency

COURSE STRUCTURE

Unit 1: Course Overview

Unit 2: Hurricane Evacuation Study Process

Unit 3: Basic Features of the MD Western Shore ATM

Unit 4: Data Entry Modules - *Demonstration I*

LUNCH BREAK

Unit 5: Data Results Modules - *Demonstration II* *Exercise I*

Unit 6: HURREVAC Integration - *Exercise II*

COURSE LOGISTICS

Course agenda

Sign in sheet

Housekeeping issues:

- Breaks
- Emergency exits / special access requirements
- Cell phone policy
- Facilities
- Other concerns

COURSE COMPLETION

Participate in all unit activities / exercises

Complete unit capstone quizzes

Complete the end-of-course evaluation

UNIT 2

The Hurricane Evacuation Study (HES) Process

UNIT OBJECTIVES

Understand the background and components of the Maryland Western Shore Hurricane Evacuation Study

Identify the steps in the evacuation planning process

- **Step 1: Establish Evacuation Zones**
- **Step 2: Establish Evacuation Roadway Network**
- **Step 3: Collect Demographic and Behavioral Data**
- **Step 4: Generate Evacuation Statistics** (includes shelter demand and capacity)
- **Step 5: Distribute Evacuation Trips**
- **Step 6: Identify Vehicles by Roadway Segment**
- **Step 7: Calculate Clearance Times**

Define evacuation clearance time and understand its components

BACKGROUND AND COMPONENTS

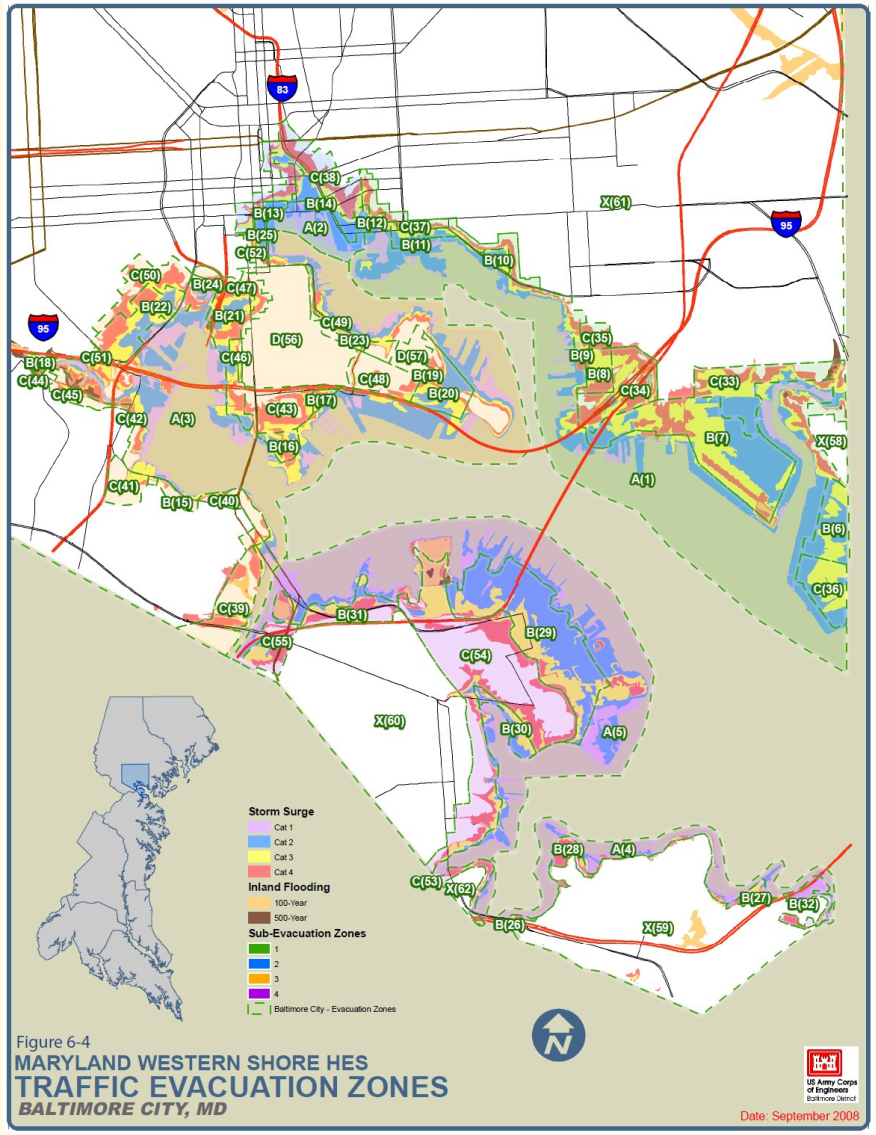
Draft HES / Technical Data Report delivered in December 2009; represents the first study done for the Western Shore region of the State

The MD Western Shore HES / TDR:

- Provides a calculation of clearance times by county for inclusion in HURREVAC
- ATM allows users to model different scenarios “on the fly”

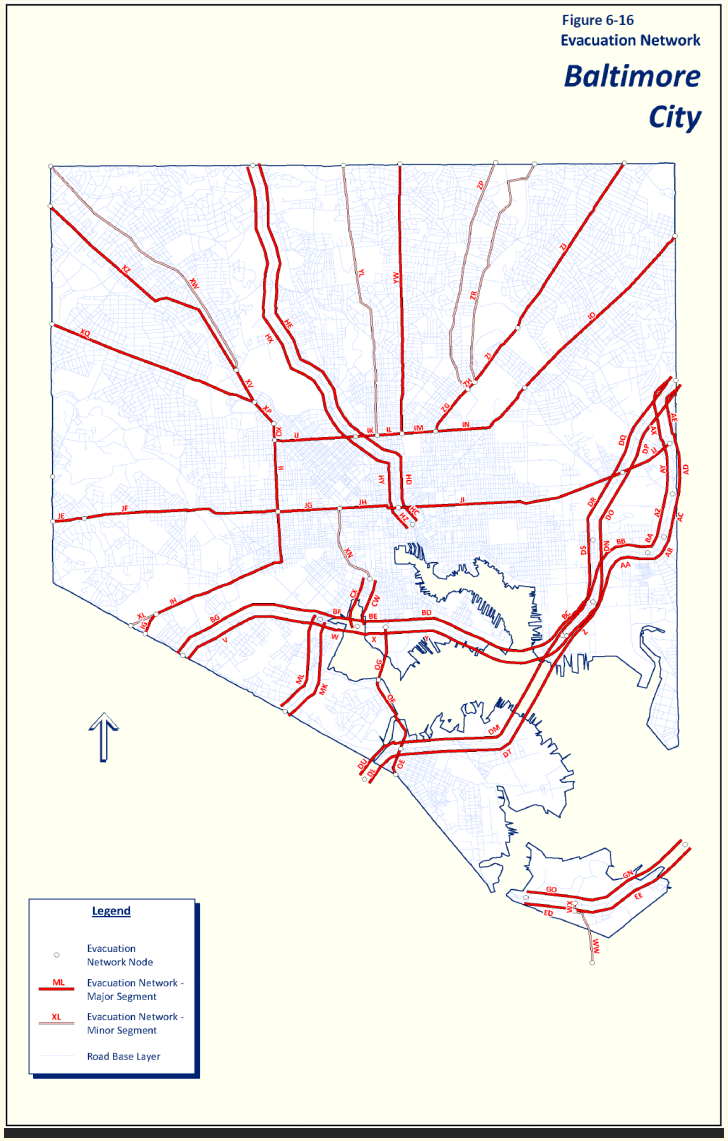
EVACUATION PLANNING PROCESS

Establish Evacuation Zones



EVACUATION PLANNING PROCESS

Establish Evacuation Roadway Network



EVACUATION PLANNING PROCESS

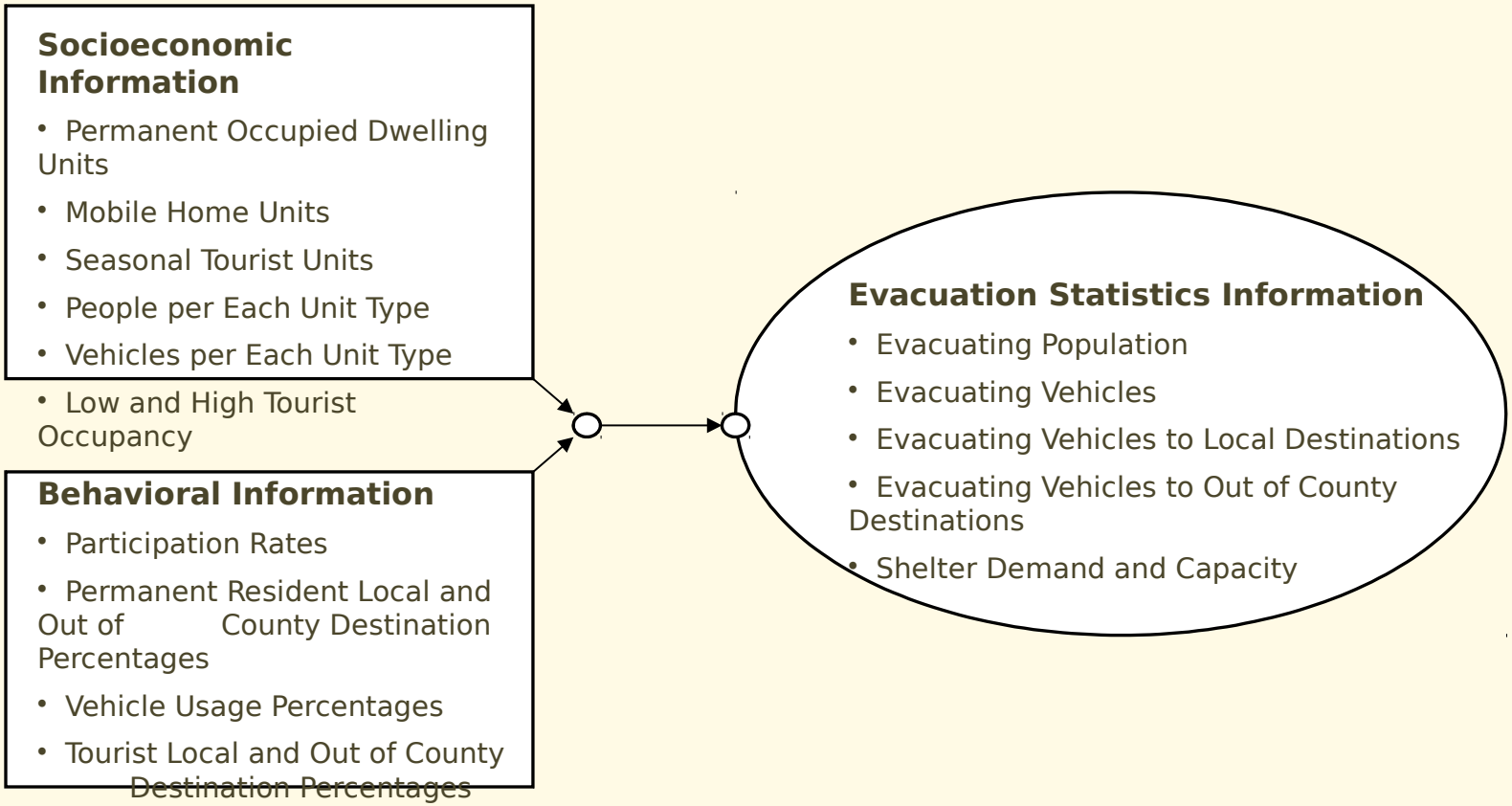
Collect Demographic Data

- Population data was obtained from the US Census and Maryland Property View parcel data
- Tourist data was obtained by the Army Corps of Engineers in coordination with the State and local governments

Collect Behavioral Data

- A behavioral study was undertaken as part of the HES process

Generate Evacuation Statistics


Socioeconomic Information
• Permanent Occupied Dwelling Units
• Mobile Home Units
• Seasonal Tourist Units
• People per Each Unit Type
• Vehicles per Each Unit Type
• Low and High Tourist Occupancy
Behavioral Information
• Participation Rates
• Permanent Resident Local and Out of County Destination Percentages
• Vehicle Usage Percentages
• Tourist Local and Out of County Destination Percentages
Evacuation Statistics Information
• Evacuating Population
• Evacuating Vehicles
• Evacuating Vehicles to Local Destinations
• Evacuating Vehicles to Out of County Destinations
• Shelter Demand and Capacity

EVACUATION PLANNING PROCESS

Distribute Evacuation Trips

- Destination routing informed by state tourist data

Identify Evacuating Vehicles By Roadway Segment

- Vehicles routed through to peripheral destinations

Calculate Clearance Times

- High / low tourist occupancy; fast, medium and slow response time

EVACUATION PLANNING PROCESS

PRE-LANDFALL HAZARDS TIME

CLEARANCE TIMES

MOBILIZATION TIME

TRAVEL TIME

QUEUING DELAY TIME

TROPICAL STORM WINDS TIME

SURGE ROADWAY INUNDATION TIME

ISSUANCE OF LOCAL EVACUATION ADVISORY

HURRICANE EYE LANDFALL

UNIT 2 – CAPSTONE QUIZ

Identify the main components of the Draft 2009 MD Western Shore HES

List the seven steps in the evacuation modeling process

Define clearance time

UNIT 2 – SUMMARY

The Draft 2009 MD Western Shore HES / TDR provides estimates of clearance times and includes an ATM

The seven steps in the evacuation modeling process include;

Step 1: Establish Evacuation Zones
Step 2: Establish Evacuation Roadway Network
Step 3: Collect Demographic and Behavioral Data
Step 4: Generate Evacuation Statistics
Step 5: Distribute Evacuation Trips
Step 6: Identify Vehicles by Roadway Segment
Step 7: Calculate Clearance Times

Clearance time is the time between when the first person leaves their home until the last person reaches their destination. It includes mobilization time, travel time and queuing time delay. Evacuations must be completed prior to tropical storm force (39 mph) winds.

UNIT 3

Basic Features of the MD Western Shore ATM

UNIT OBJECTIVES

Understand the structure and content of the ATM

- Microsoft Excel-based
- Includes 36 separate worksheets

Open the ATM and navigate through the spreadsheet modules

Understand how to interpret the clearance times worksheet

- Identifying focal points clearance times by scenario
- How county clearance times are determined

ATM STRUCTURE

Microsoft Excel-based

- Accessible and easy to update
- Provides reliable results
- Allows testing of new scenarios “on the fly”

Includes 36 separate but integrated worksheets

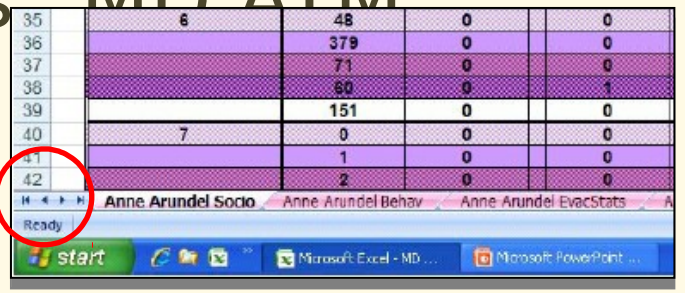
- Three primary input modules (**socioeconomic data, behavioral data, out route assignment**)
- Two primary output module (**evacuation statistics, shelter demand and capacity**)
- One module (**evacuating vehicles**) with inputs and outputs

ATM CONTENT

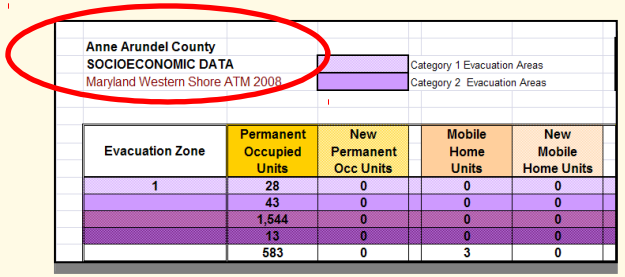
Open the ATM by double clicking on the Excel file icon

Immediately save a copy as "MD ATM Navigation Test"

Use the arrows at the bottom of the screen to open the "Anne Arundel Socio" worksheet



Navigate to the upper right hand corner of the worksheet



Raise hands to ask questions during the navigation

The instructor-guided navigation will

CLEARANCE TIME WORKSHEET

Using the worksheet tabs, navigate to the Clearance Times worksheet which is labeled, "Clearance Tms"

Navigate to the upper right hand corner of the

ROADWAY AND CLEARANCE TIME CHARACTERISTICS
Maryland Western Shore ATM 2008

Regional Bottlenecks	Bottleneck Location/ Critical Roadway Segment	MEDIUM RESPONSE TIME							
		Cat 1		Cat 2		Cat 3		Cat 4	
		Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
Anne Arundel County	US 50 between Annapolis and I-97	3.8	4.1	4.2	4.6	4.7	5.3	5.1	5.7
	I-97 between SR 2 and I-695	3.8	4.0	4.0	4.3	4.3	4.6	4.5	4.8
	SR 295 from I-195 to I-695	4.3	4.5	4.3	4.6	4.4	4.9	4.5	4.9
	SR 10/100 below SR 10 split	4.3	4.5	4.7	4.9	5.1	5.4	5.6	5.9
	SR 2 at intersection of SR 10	3.5	3.8	3.9	4.2	4.5	5.0	5.0	5.5
	SR 2 from Steuart Crnr to Annapolis	6.0	6.4	6.9	7.5	8.3	9.1	8.6	9.4
Baltimore County	I-695 from Southeast Blvd to I-95	7.8	8.0	7.8	8.1	8.0	8.3	8.7	9.0
	I-95 between I-895 and I-695	5.6	5.9	5.8	6.2	6.0	6.6	6.3	6.9
	I-695 and I-83 interchange	3.9	4.1	4.0	4.2	4.1	4.4	4.3	4.6
	I-695 and I-70 interchange	6.4	6.9	6.7	7.2	7.0	7.7	7.4	8.1
	I-70 Westbound from I-695 to Howard Co. line	1.5	1.8	1.7	2.0	1.9	2.4	2.3	2.7
	Francis Scott Key Bridge Southbound	8.1	8.3	8.3	8.6	8.7	9.0	9.3	9.6
	SR 40 westbound from I-695 to City Boundary	5.6	5.9	6.0	6.2	6.6	6.9	7.2	7.5
	SR 150 westbound from I-695 to City Boundary	3.5	3.6	3.6	3.8	3.8	4.0	4.6	4.8
	I-95 to I-695	4.6	4.7	4.6	4.7	4.6	4.8	4.7	4.9
Baltimore City	Interchange of I-95 and I-895 (Exit 57) *	4.3	4.6	4.6	5.0	4.9	5.5	5.1	5.6
	Interchange of I-95 and I-895 (Exit 62) *	3.9	4.2	4.1	4.5	4.3	4.9	4.6	5.1
	US 40 between Cooks Lane and US 1/Fulton Ave *	6.8	7.3	7.1	7.6	7.6	8.2	8.2	8.8
	I-83 to Baltimore County *	4.1	4.2	4.1	4.3	4.2	4.4	4.3	4.5
Calvert County	SR 2/4 north of Huntingtown	5.5	6.2	6.1	7.1	7.1	8.4	8.3	9.6
	SR 4 northbound to Anne Arundel Co. line	4.1	4.9	4.6	5.6	5.3	6.7	5.9	7.4
	SR 2 northbound to Anne Arundel Co. line	4.3	4.7	4.6	5.2	5.2	6.0	5.8	6.6
Charles County	US 301 between SR 5 and Waldorf	3.8	4.4	4.2	5.0	4.7	5.8	5.1	6.3
	SR 5 westbound at intersection of US 301	3.8	4.5	4.3	5.2	5.0	6.3	5.7	6.9
	SR 210 at intersection of SR 228 (in PG Co.)	2.8	3.0	2.9	3.2	3.1	3.5	3.3	3.7
	US 301 bridge over Potomac River to Virginia	1.3	1.6	1.6	2.0	1.9	2.5	2.2	2.8
Harford	SR 22 from Aberdeen Blvd to US 40	2.9	3.0	2.9	3.0	3.0	3.1	3.0	3.2
	SR 24 between US 40 and I-95	3.3	3.4	3.4	3.4	3.5	3.6	3.5	3.7
	US 1 between SR 23 and SR 543	3.4	3.5	3.5	3.6	3.6	3.7	3.8	3.9
	I-95 northbound from SR 155 to Cecil Co	2.7	2.7	2.7	2.8	2.8	2.9	2.8	2.9
	I-95 southbound from SR 152 to Baltimore Co	3.1	3.3	3.2	3.4	3.3	3.7	3.5	3.8
Prince George's County	US 50 between US 301 and I-95/495	2.6	2.8	2.7	3.0	3.0	3.3	3.2	3.6
	SR 210 to I-95/495	3.7	4.0	3.9	4.3	4.1	4.7	4.4	5.0
	SR 5 to I-95/495	7.4	8.0	7.7	8.6	8.3	9.5	8.8	10.1
	SR 4 to I-95/495	2.6	2.9	2.9	3.3	3.3	3.8	3.6	4.1
	I-95/495 between SR210 and I-295	3.6	3.9	3.8	4.2	4.0	4.6	4.2	4.8
	I-95 at I-95/495 interchange	5.3	5.7	5.5	6.0	5.8	6.6	6.1	7.0
St. Mary's County	SR 5 thru Newmarket and Hughesvile	2.5	2.9	2.8	3.4	3.2	4.0	3.6	4.3
	Intersection of SR 4 and SR 235	3.3	3.7	3.5	4.0	3.8	4.4	4.0	4.7

Background Traffic (AADT) Peak Hour
5,680
6,240
4,665
3,730
[illegible]
2,240
7,260
8,320
10,355
9,560
1,240
6,700
2,340
1,570
8,795

Background Traffic adjustment column inset for illustration purposes

RESULTS WORKSHEET

The Clearance Times Table

COUNTY AND CITY CLEARANCE TIME BY SCENARIO
Maryland Western Shore ATM 2008

		Clearance Times WITHOUT DelMarVa Traffic							
	Speed of Public Response	Cat 1		Cat 2		Cat 3		Cat 4	
		Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
Anne Arundel County	Slow	7.5	7.9	8.4	9.0	9.8	10.5	10.1	10.8
	Medium	6.0	6.4	6.9	7.5	8.3	9.1	8.6	9.4
	Fast	4.3	4.7	5.2	5.8	6.6	7.4	7.0	7.7
Baltimore County	Slow	10.3	10.5	10.5	10.7	10.9	11.2	11.5	11.8
	Medium	8.1	8.3	8.3	8.6	8.7	9.0	9.3	9.6
	Fast	6.1	6.3	6.1	6.4	6.2	6.6	7.0	7.3
Baltimore City	Slow	8.7	9.3	9.0	9.6	9.5	10.1	10.1	10.7
	Medium	6.8	7.3	7.1	7.6	7.6	8.2	8.2	8.8
	Fast	4.5	5.0	4.8	5.4	5.3	5.9	5.9	6.5
Calvert County	Slow	6.9	7.6	7.6	8.6	8.5	9.9	9.7	11.1
	Medium	5.5	6.2	6.1	7.1	7.1	8.4	8.3	9.6
	Fast	3.8	4.5	4.4	5.4	5.4	6.8	6.6	8.0
Charles County	Slow	5.0	5.6	5.4	6.3	6.1	7.4	6.8	8.0
	Medium	3.8	4.5	4.3	5.2	5.0	6.3	5.7	6.9
	Fast	2.6	3.2	3.0	3.9	3.8	5.0	4.4	5.7
Harford County	Slow	4.6	4.6	4.6	4.7	4.7	4.8	4.9	5.0
	Medium	3.4	3.5	3.5	3.6	3.6	3.7	3.8	3.9
	Fast	2.2	2.3	2.3	2.3	2.4	2.5	2.5	2.6
Prince George's County	Slow	9.7	10.3	10.0	10.9	10.6	11.8	11.1	12.3
	Medium	7.4	8.0	7.7	8.6	8.3	9.5	8.8	10.1
	Fast	4.7	5.4	5.1	6.0	5.7	6.9	6.2	7.4
St. Mary's County	Slow	4.2	4.5	4.4	4.8	4.7	5.3	4.9	5.5
	Medium	3.3	3.7	3.5	4.0	3.8	4.4	4.0	4.7
	Fast	2.3	2.7	2.5	3.0	2.8	3.4	3.1	3.7

CLEARANCE TIME ESTIMATES

Comparing the Clearance Time and Results

Regional Bottlenecks	Bottleneck Location/ Critical Roadway Segment	Cat 1 Low Occupancy	Cat 1 High Occupancy
Anne Arundel County	US 50 between Annapolis and I-97	3.8	4.1
	I-97 between SR 2 and I-695	3.8	4.0
	SR 295 from I-195 to I-695	4.3	4.5
	SR 10/100 below SR 10 split	4.3	4.5
	SR 2 at intersection of SR 10	3.5	3.8
	SR 2 from Steuart Crnr to Annapolis	6.0	6.4
Baltimore County	I-695 from Southeast Blvd to I-95	7.8	8.0
	I-95 between I-895 and I-695	5.6	5.9
	I-695 and I-83 interchange	3.9	4.1
	I-695 and I-70 interchange	6.4	6.9
	I-70 Westbound from I-695 to Howard Co. line	1.5	1.8
	Francis Scott Key Bridge Southbound	8.1	8.3
	SR 40 westbound from I-695 to City Boundary	5.6	5.9
	SR 150 westbound from I-695 to City Boundary	3.5	3.6
	I-95 to I-695	4.6	4.7

Results worksheet inset for illustration purposes

	Speed of Public Response	Cat 1 Low Occupancy	Cat 1 High Occupancy
Anne Arundel County	Slow	7.5	7.9
	Medium	6.0	6.4
	Fast	4.3	4.7
Baltimore County	Slow	10.3	10.5
	Medium	8.1	8.3
	Fast	6.1	6.3

UNIT 3 – CAPSTONE QUIZ

Lists four benefits of the Microsoft Excel platform

Identify the six functional modules or groupings of worksheets included in the MD Western Shore ATM

Explain how the clearance times generated for each bottleneck or critical roadway segment are used to establish county clearance time estimates

UNIT 3 – SUMMARY

The Excel-based platform is assessable and easy to use. The model provides reliable results and allows users to test different scenarios.

The six functional groupings of worksheets or modules include;

Demographic Data Module (8 jurisdictional worksheets - *7 counties, 1 city*)

Behavioral Data Module (8 worksheets)

Out Route Assignment Module (9 worksheets - 8 jurisdictions, 1 summary sheet)

Shelter Demand and Capacity Module (8 worksheets)

Evacuation Statistics Module (8 worksheets)

Evacuating Vehicles Module (Vehicles by Road, Clearance Times, Results)

The clearance time table is used to identify the regional bottlenecks with the worst clearance times. If a significant portion of a County's evacuating traffic

UNIT 4

Data Entry Modules

DEMONSTRATION I

UNIT OBJECTIVES

Understand the structure of the three primary data entry modules

- Socioeconomic data module
- Behavioral data module
- Out route assignment module

Identify how data may be entered in the Evacuating Vehicles Module / Clearance Time worksheet

- Directional service volume
- Background traffic

Demonstrate proficiency in adding data to various worksheets

SOCIOECONOMIC DATA MODULE

Save a copy of the ATM as “MD ATM Demonstration I”

Baltimore County
SOCIOECONOMIC DATA
Maryland Western Shore ATM 2008

Category 1 Evacuation Areas
Category 2 Evacuation Areas
Category 3 Evacuation Areas
Category 4 Evacuation Areas
Inland Area (Non Surge)

Evacuation Zone	Permanent Occupied Units	New Permanent Occ Units	Mobile Home Units	New Mobile Home Units	Seasonal / Tourist Units	New Tourist Units	People Per Permanent Unit	People Per Mobile Home Unit	People Per Seasonal / Tourist Unit
1	0	0	0	0	0	0	2.13	2.13	3.00
	0	0	0	0	0	0	2.13	2.13	3.00
	0	0	0	0	0	0	2.13	2.13	3.00
	0	0	0	0	0	0	2.13	2.13	3.00
	0	0	0	0	0	0	2.13	2.13	3.00

Vehicles Per			Tourist Occupancy	
Permanent Unit	Mobile Home Unit	Seasonal / Tourist Unit	Low	High
0.03	0.03	1.05	30%	90%
0.03	0.03	1.05	30%	90%
0.03	0.03	1.05	30%	90%
0.03	0.03	1.05	30%	90%
0.03	0.03	1.05	30%	90%

The ATM users may adjust any variable within this worksheet

BEHAVIORAL DATA MODULE

Baltimore County
BEHAVIORAL DATA
Maryland Western Shore ATM 2008

	Category 1 Evacuation Areas
	Category 2 Evacuation Areas
	Category 3 Evacuation Areas
	Category 4 Evacuation Areas
	Inland Area (Non Surge)

Evacuation Zone	Participation Rates											
	Cat 1 Scenario			Cat 2 Scenario			Cat 3 Scenario			Cat 4 Scenario		
	Permanent Units	Mobile Home Units	Seasonal / Tourist Units	Permanent Units	Mobile Home Units	Seasonal / Tourist Units	Permanent Units	Mobile Home Units	Seasonal / Tourist Units	Permanent Units	Mobile Home Units	Seasonal / Tourist Units
1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Baltimore County
BEHAVIORAL DATA
Maryland Western Shore ATM 2008

Permanent Resident / Mobile Home Destination Percentages											
Percent to Local Shelters				Percent to Other Local Destinations				Percent Out of County			
Cat 1	Cat 2	Cat 3	Cat 4	Cat 1	Cat 2	Cat 3	Cat 4	Cat 1	Cat 2	Cat 3	Cat 4
5%	5%	3%	3%	60%	50%	52%	47%	35%	45%	45%	50%
5%	5%	5%	5%	60%	55%	55%	50%	35%	40%	40%	45%
10%	10%	5%	5%	55%	60%	55%	50%	35%	30%	40%	45%
15%	15%	10%	10%	60%	60%	55%	50%	25%	25%	35%	40%
15%	15%	10%	10%	65%	60%	55%	50%	20%	25%	35%	40%

These table segments represent the complete column fields of the worksheet

Baltimore County
BEHAVIORAL DATA
Maryland Western Shore ATM 2008

Vehicle Usage		Seasonal / Tourist Destination Percentages											
		Percent to Local Shelters				Percent to Other Local Destinations				Percent Out of County			
Permanent / Mobile Home Units	Seasonal / Tourist Units	Cat 1	Cat 2	Cat 3	Cat 4	Cat 1	Cat 2	Cat 3	Cat 4	Cat 1	Cat 2	Cat 3	Cat 4
70%	100%	1%	0%	0%	0%	0%	0%	0%	0%	99%	100%	100%	100%
65%	100%	1%	1%	0%	0%	0%	0%	0%	0%	99%	99%	100%	100%
65%	100%	1%	1%	0%	0%	0%	0%	0%	0%	99%	99%	100%	100%
65%	100%	1%	1%	0%	0%	0%	0%	0%	0%	99%	99%	100%	100%
60%	100%	1%	1%	0%	0%	0%	0%	0%	0%	99%	99%	100%	100%

OUT ROUTE ASSIGNMENT MODULE

Left Half

Baltimore County
OUT-ROUTES TO OTHER COUNTIES
Maryland Western Shore ATM 2008

Baltimore	I-895 To I-97	SR 295 SB	I-695 Outer	I-895 To I-95	US 1 SB	I-95 SB
1	0%	0%	0%	0%	0%	0%
2	0%	0%	0%	0%	0%	0%
3	5%	15%	5%	8%	5%	15%
4	0%	0%	0%	0%	0%	0%
5	0%	5%	5%	15%	0%	20%
6	0%	0%	0%	0%	0%	0%
7	0%	5%	5%	15%	0%	20%
8	0%	0%	5%	5%	0%	15%
9	0%	0%	0%	0%	0%	0%
10	0%	0%	5%	5%	0%	15%

Data entry fields are on the left hand side of the worksheet, results are on the right

The data entry fields on the left hand side of the worksheet include additional out routes

Right Half

US 1 Southbound							
Cat 1		Cat 2		Cat 3		Cat 4	
Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
5	12	6	17	11	26	17	32
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

I-95 Southbound							
Cat 1		Cat 2		Cat 3		Cat 4	
Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
14	36	19	50	33	78	52	96
0	0	0	0	0	0	0	0
8	21	11	29	21	45	33	58
0	0	0	0	0	0	0	0
20	52	27	73	46	112	66	131
10	26	14	36	23	55	32	65
0	0	0	0	0	0	0	0
7	19	10	26	16	39	22	46

EVACUATING VEHICLES MODULE

ROADWAY AND CLEARANCE TIME CHARACTERISTICS
Maryland Western Shore ATM 2008

Regional Bottlenecks	Bottleneck Location/ Critical Roadway Segment	Evac Dir Srvc Vol (Veh/Hr)	Evacuation Servvice Volume During Event				Background Traffic (AADT) Peak Hour	Travel Time To County Line (Hours)
			1st Quarter	2nd Quarter	3rd Quarter	4th Quarter		
Anne Arundel County	US 50 between Annapolis and I-97	5410	5410	5085	4869	5410	5,680	0.12
	I-97 between SR 2 and I-695	5410	5410	5085	4869	5410	6,240	0.05
	SR 295 from I-195 to I-695	3440	3440	3234	3096	3440	4,565	0.01
	SR 10/100 below SR 10 split	2980	2980	2801	2682	2980	3,730	0.22
	SR 2 at intersection of SR 10	1810	1810	1701	1629	1810	1,675	0.22
	SR 2 from Steuart Crnr to Annapolis	1710	1710	1607	1539	1710	2,240	0.83
Baltimore County	I-695 from Southeast Blvd to I-95	5410	5410	5085	4869	5410	7,260	0.60
	I-95 between I-895 and I-695	5410	5410	5085	4869	5410	8,320	0.60
	I-695 and I-83 interchange	9340	9340	8780	8406	9340	10,355	0.40
	I-695 and I-70 interchange	5410	5410	5085	4869	5410	9,560	0.65
	I-70 Westbound from I-695 to Howard Co. line	5410	5410	5085	4869	5410	1,240	0.42
	Francis Scott Key Bridge Southbound	3440	3440	3234	3096	3440	6,700	0.72
	SR 40 westbound from I-695 to City Boundary	1860	1860	1748	1674	1860	2,340	0.00
	SR 150 westbound from I-695 to City Boundary	1860	1860	1748	1674	1860	1,570	0.00
	I-95 to I-695	7380	7380	6937	6642	7380	8,795	0.82

Directional Service Volume and Background Traffic may be adjusted using the highlighted columns

DEMONSTRATION I

This instructor-led demonstration should take 15 minutes to complete

Participants will build skills in entering data into the ATM and reading the results

Instructors will walk through the demonstration using the ATM to answer each question

Participants are encouraged to ask questions during the demonstration

Remember - Work from the copy of the ATM saved as

UNIT 4 – CAPSTONE QUIZ

Identify which of the three primary data entry modules would most commonly be used for updating data and testing new scenarios

Identify which two variables may be adjusted in the Evacuation Vehicles module / Clearance Time worksheet

UNIT 4 – SUMMARY

While the three primary data entry modules; Socioeconomic, Behavioral, and Out Route Assignment, can all be modified by users, the Socioeconomic Data would most likely be accessed to adjust for common changes such as population growth

The Clearance Time worksheet may be adjusted to account for changes in service volumes on critical roadway segments as well as for anticipated background traffic

UNIT 5

Data Results Modules

DEMONSTRATION II

EXERCISE I

UNIT OBJECTIVES

Understand the structure of the three primary data results modules

- Evacuation Statistics module
- Shelter Demand and Capacity module
- Evacuating Vehicles module

Interpret the data results portion of the Out Route Assignments module

Understand the connection between the Clearance Times worksheet and the HES's Clearance Times table

Demonstrate proficiency in using the full ATM in support of a facilitated table top

EVACUATION STATISTICS MODULE

Save a copy of the ATM as “MD ATM Demonstration II”

Navigate to “St. Mary’s EvacStats” worksheet

St. Mary's County
EVACUATION PEOPLE AND VEHICLE STATISTICS
Maryland Western Shore ATM 2008

Category 1 Evacuation Areas
Category 2 Evacuation Areas
Category 3 Evacuation Areas
Category 4 Evacuation Areas
Inland Area (Non Surge)

	Evacuating People								Evacuating People to Local Shelters							
	Cat 1		Cat 2		Cat 3		Cat 4		Cat 1		Cat 2		Cat 3		Cat 4	
Evac Area	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
1	405	461	405	461	405	461	405	461	19	20	19	19	11	11	11	11
	55	149	468	572	468	572	468	572	1	2	1	2	0	0	0	0
	16	41	34	70	362	412	362	412	0	1	0	1	0	0	0	0
	69	177	90	241	137	353	1,561	1,777	3	4	3	4	1	1	1	1
	1,138	1,743	1,552	2,400	2,275	3,487	2,579	3,790	128	134	128	134	83	83	83	83

	Evacuating Vehicles								Evacuating Vehicles to Local Shelters							
	Cat 1		Cat 2		Cat 3		Cat 4		Cat 1		Cat 2		Cat 3		Cat 4	
	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupanc	High Occupanc	Low Occupanc	High Occupanc	Low Occupanc	High Occupanc	Low Occupanc	High Occupanc
	205	224	205	224	205	224	205	224	10	10	10	10	6	6	6	6
	20	53	218	254	218	254	218	254	0	1	10	11	10	10	10	10
	6	15	14	27	170	188	170	188	0	0	1	1	8	8	8	8
	26	64	33	86	52	127	735	811	1	2	1	2	1	1	70	70
	514	726	702	999	1,029	1,453	1,163	1,587	62	64	85	88	82	82	95	95

	Evac Vehicles to Other Local Destinations								Evac Vehicles to Out of County Locations							
	Cat 1		Cat 2		Cat 3		Cat 4		Cat 1		Cat 2		Cat 3		Cat 4	
	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
	117	117	97	97	101	101	92	92	78	97	98	117	98	117	107	127
	2	2	110	110	110	110	100	100	18	50	98	134	98	135	108	145
	1	1	5	5	89	89	81	81	5	14	9	21	73	91	82	99
	4	4	4	4	8	8	349	349	20	58	28	80	43	118	317	392
	266	266	332	332	449	449	476	476	187	397	285	579	498	922	593	1,017

Tourist Vehicles to Out of County Locations							
Cat 1		Cat 2		Cat 3		Cat 4	
Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
10	29	10	29	10	29	10	29
16	49	18	54	18	55	18	55
4	13	6	18	9	26	9	26
19	56	26	79	38	113	38	113
105	315	147	441	212	636	212	636

These table segments represent the complete column fields of the worksheet

SHELTER MODULE

Navigate to “Charles Shelter” worksheet

Charles County
SHELTER DEMAND AND CAPACITY WORKSHEET
Maryland Western Shore ATM 2008

Category 1 Evacuation Areas
Category 2 Evacuation Areas

Behavioral Shelter Demand

Zone	Cat 1 Low Occupancy	Cat 1 High Occupancy	Cat 2 Low Occupancy	Cat 2 High Occupancy	Cat 3 Low Occupancy	Cat 3 High Occupancy	Cat 4 Low Occupancy	Cat 4 High Occupancy
1	89	99	87	93	52	52	52	52
2	10	11	10					
3	14	16	10					
4	4	4	4					
5	41	41	41					
6	5	6	4					
7	12	13	9					
8	9	9	9					
9	8	8	6					
10	7	9	6					
11	11	11	8					
12	23	25	18					
13	6	6	4					
14	7	8	7					
15	58	63	47					
16	8	10	8					
17	17	18	14					
18	86	91	69					
19	34	36	28					
20	41	43	33					
21	35	36	35					
	525	563	457	493	75	66	66	66

Zone Shelter Capacity

Evacuating Vehicles to Local Shelters								
Category 1		Category 2		Category 3		Category 4	
Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
33	36	47	50	46	46	71	71
4	4	6	6	6	6	8	8

Evacuating Vehicles to Local Shelters Leaving Area

Category 1		Category 2		Category 3		Category 4	
Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Zone Shelter Allocation

Category 1		Category 2		Category 3		Category 4	
Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
1,826	1,894	2,050	2,032	1,518	1,518	1,560	1,560
205	210	236	240	204	204	210	210

Zone Shelter Satifaction Rate Inverse

Category 1		Category 2		Category 3		Category 4	
Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy	Low Occupancy	High Occupancy
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

These table segments represent the complete column fields of the worksheet

EVACUATING VEHICLES MODULE

EVACUATING VEHICLES BY BOTTLENECK/CRITICAL ROADWAY SEGMENT
Maryland Western Shore ATM 2008

Regional Bottlenecks	Bottleneck Location/ Critical Roadway Segment	EVACUATING VEHICLES BY SCENARIO								Bottleneck Location/ Critical Roadway Segment
		Cat 1		Cat 2		Cat 3		Cat 4		
		Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ	
Anne Arundel County	US 50 between Annapolis and I-97	2,221	3,846	4,089	6,270	6,816	9,840	8,714	11,744	US 50 between Annapolis and I-97
	I-97 between SR 2 and I-695	1,097	2,024	1,983	3,246	3,366	5,136	4,454	6,226	I-97 between SR 2 and I-695
	SR 295 from I-195 to I-695	447	1,132	634	1,593	1,033	2,416	1,300	2,683	SR 295 from I-195 to I-695
	SR 10/100 below SR 10 split	683	1,126	1,603	2,206	2,903	3,736	4,315	5,150	SR 10/100 below SR 10 split
	SR 2 at intersection of SR 10	757	1,155	1,439	1,974	2,478	3,212	3,306	4,043	SR 2 at intersection of SR 10
	SR 2 from Steuart Crnr to Annapolis	1,793	2,446	3,298	4,176	5,458	6,667	5,974	7,184	SR 2 from Steuart Crnr to Annapolis
Baltimore County	I-695 from Southeast Blvd to I-95	15,278	16,554	15,624	17,119	16,222	18,055	19,811	21,643	I-695 from Southeast Blvd to I-95
	I-95 between I-895 and I-695	1,379	2,887	2,040	4,039	3,407	6,141	5,018	7,753	I-95 between I-895 and I-695
	I-695 and I-83 interchange	1,051	2,576	1,730	3,429	2,722	4,875	4,281	6,435	I-695 and I-83 interchange
	I-695 and I-70 interchange	1,619	3,892	2,989	5,416	4,683	8,091	6,567	9,977	I-695 and I-70 interchange
	I-70 Westbound from I-695 to Howard Co. line	2,126	3,521	2,764	4,527	3,978	6,281	5,686	7,998	I-70 Westbound from I-695 to Howard Co. line
	Francis Scott Key Bridge Southbound	4,359	5,157	4,971	5,827	6,296	7,251	8,366	9,321	Francis Scott Key Bridge Southbound
	SR 40 westbound from I-695 to City Boundary	3,015	3,498	3,590	4,086	4,642	5,162	5,746	6,266	SR 40 westbound from I-695 to City Boundary
	SR 150 westbound from I-695 to City Boundary	1,477	1,770	1,668	1,985	2,071	2,425	3,439	3,792	SR 150 westbound from I-695 to City Boundary
	I-95 to I-695	388	1,021	546	1,432	911	2,188	1,268	2,545	I-95 to I-695
Baltimore City	Interchange of I-95 and I-895 (Exit 57)	1,058	2,501	2,335	4,319	3,998	6,793	4,878	7,673	Interchange of I-95 and I-895 (Exit 57)
	Interchange of I-95 and I-895 (Exit 62)	1,254	2,727	1,906	3,856	3,181	5,850	4,532	7,202	Interchange of I-95 and I-895 (Exit 62)
	US 40 between Cooks Lane and US 1/Fulton Ave	1,265	1,984	1,687	2,470	2,338	3,187	3,223	4,072	Reisterstown Ave from Fulton Ave to SR 26
	I-83 to Baltimore County	566	1,290	899	1,701	1,330	2,206	1,962	2,838	I-83 to Baltimore County
Calvert County	SR 2/4 north of Huntingtown	1,993	3,234	3,123	4,793	4,730	7,032	6,717	9,022	SR 2/4 north of Huntingtown
	SR 4 northbound to Anne Arundel Co. line	1,055	2,174	1,776	3,276	2,753	4,828	3,755	5,833	SR 4 northbound to Anne Arundel Co. line
	SR 2 northbound to Anne Arundel Co. line	374	639	615	971	945	1,433	1,307	1,796	SR 2 northbound to Anne Arundel Co. line
Charles County	US 301 at intersection of SR 5	1,537	3,132	2,410	4,557	3,718	6,705	4,951	7,937	US 301 between Waldorf and SR 5
	SR 5 westbound at intersection of US 301	1,140	2,248	1,906	3,407	3,125	5,217	4,229	6,320	SR 5 westbound at intersection of US 301
	SR 210 at intersection of SR 228 (in PG Co.)	501	1,061	782	1,544	1,224	2,298	1,629	2,700	SR 210 at intersection of SR 228 (in PG Co.)
	US 301 bridge over Potomac River to Virginia	821	1,600	1,497	2,533	2,452	3,879	3,262	4,690	US 301 bridge over Potomac River to Virginia
Harford County	SR 22 from Aberdeen Blvd to US 40	146	294	210	415	293	584	365	656	SR 22 from Aberdeen Blvd to US 40
	SR 24 between US 40 and I-95	122	228	226	373	426	631	530	735	SR 24 between US 40 and I-95
	US 1 between SR 23 and SR 543	263	391	325	505	527	780	818	1,076	US 1 between SR 23 and SR 543
	I-95 northbound from SR 155 to Cecil Co	259	600	421	895	738	1,415	979	1,657	I-95 northbound from SR 155 to Cecil Co
	I-95 southbound from SR 152 to Baltimore Co	925	2,157	1,429	3,149	2,589	5,057	3,399	5,871	I-95 southbound from SR 152 to Baltimore Co
Prince George's County	US 50 between US 301 and I-95/495	1,333	2,500	2,288	3,863	3,852	6,042	5,508	7,701	US 50 between US 301 and I-95/495
	SR 210 to I-95/495	663	1,426	990	2,039	1,647	3,136	2,441	3,926	SR 210 to I-95/495
	SR 5 to I-95/495	1,590	3,203	2,420	4,616	3,857	6,940	5,221	8,306	SR 5 to I-95/495
	SR 4 to I-95/495	1,634	3,011	3,102	4,920	5,043	7,516	6,349	8,825	
	I-95/495 between SR210 and I-295	1,529	3,563	2,475	5,279	4,116	8,100	5,512	9,499	I-95 at I-95/495 interchange
	I-95 at I-95/495 interchange	2,315	5,274	3,673	7,755	6,113	11,916	8,483	14,289	SR 295 at I-95/495 interchange
St. Mary's County	SR 5 thru Newmarket	1,032	2,077	1,783	3,191	2,898	4,856	3,837	5,794	SR 5 thru Newmarket
	Intersection of SR 4 and SR 235	491	1,034	791	1,528	1,256	2,288	1,676	2,709	Intersection of SR 4 and SR 235
	Wm Preston Lane Mem. Bridge (US 50 / 301) (figures from DelMarVa ATM)	11,754	44,366	21,773	60,016	35,741	80,218	48,742	93,224	

OUT ROUTE ASSIGNMENT MODULE

Left Half

Baltimore County
OUT-ROUTES TO OTHER COUNTIES
Maryland Western Shore ATM 2008

Baltimore	I-895 To I-97	SR 295 SB	I-695 Outer	I-895 To I-95	US 1 SB	I-95 SB
1	0%	0%	0%	0%	0%	0%
2	0%	0%	0%	0%	0%	0%
3	5%	15%	5%	8%	5%	15%
4	0%	0%	0%	0%	0%	0%
5	0%	5%	5%	15%	0%	20%
6	0%	0%	0%	0%	0%	0%
7	0%	5%	5%	15%	0%	20%
8	0%	0%	5%	5%	0%	15%
9	0%	0%	0%	0%	0%	0%
10	0%	0%	5%	5%	0%	15%

Data entry fields are on the left hand side of the worksheet, results are on the right

The data entry fields on the left hand side of the worksheet include additional out routes

Right Half

US 1 Southbound							
Cat 1		Cat 2		Cat 3		Cat 4	
Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
5	12	6	17	11	26	17	32
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

I-95 Southbound							
Cat 1		Cat 2		Cat 3		Cat 4	
Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ	Low Occ	High Occ
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
14	36	19	50	33	78	52	96
0	0	0	0	0	0	0	0
8	21	11	29	21	45	33	58
0	0	0	0	0	0	0	0
20	52	27	73	46	112	66	131
10	26	14	36	23	55	32	65
0	0	0	0	0	0	0	0
7	19	10	26	16	39	22	46

CLEARANCE TIMES WORKSHEET

ROADWAY AND CLEARANCE TIME CHARACTERISTICS
Maryland Western Shore ATM 2008

MEDIUM RESPONSE TIME

Regional Bottlenecks	Bottleneck Location/ Critical Roadway Segment	Cat 1 Low Occupancy	Cat 1 High Occupancy	Cat 2 Low Occupancy	Cat 2 High Occupancy	Cat 3 Low Occupancy	Cat 3 High Occupancy	Cat 4 Low Occupancy	Cat 4 High Occupancy
Anne Arundel County	US 50 between Annapolis and I-97	3.8	4.1	4.2	4.6	4.7	5.3	5.1	5.7
	I-97 between SR 2 and I-695	3.8	4.0	4.0	4.3	4.3	4.6	4.5	4.8
	SR 295 from I-195 to I-695	4.3	4.5	4.3	4.6	4.4	4.9	4.5	4.9
	SR 10/100 below SR 10 split	4.3	4.5	4.7	4.9	5.1	5.4	5.6	5.9
	SR 2 at intersection of SR 10	3.5	3.8	3.9	4.2	4.5	5.0	5.0	5.5
	SR 2 from Steuart Crnr to Annapolis	6.0	6.4	6.9	7.5	8.3	9.1	8.6	9.4
Baltimore County	I-695 from Southeast Blvd to I-95	7.8	8.0	7.8	8.1	8.0	8.3	8.7	9.0
	I-95 between I-895 and I-695	5.6	5.9	5.8	6.2	6.0	6.6	6.3	6.9
	I-695 and I-83 interchange	3.9	4.1	4.0	4.2	4.1	4.4	4.3	4.6
	I-695 and I-70 interchange	6.4	6.9	6.7	7.2	7.0	7.7	7.4	8.1
	I-70 westbound from I-695 to Howard Co. line	1.5	1.8	1.7	2.0	1.9	2.4	2.3	2.7
	Francis Scott Key Bridge Southbound	8.1	8.3	8.3	8.6	8.7	9.0	9.3	9.6
	SR 40 westbound from I-895 to City Boundary	5.6	5.9	6.0	6.2	6.6	6.9	7.2	7.5
	SR 150 westbound from I-695 to City Boundary	3.5	3.6	3.6	3.8	3.8	4.0	4.6	4.8
	I-95 to I-695	4.6	4.7	4.6	4.7	4.6	4.8	4.7	4.9
Baltimore City	Interchange of I-95 and I-895 (Exit 57) *	4.3	4.6	4.6	5.0	4.9	5.5	5.1	5.6
	Interchange of I-95 and I-895 (Exit 62) *	3.9	4.2	4.1	4.5	4.3	4.9	4.6	5.1
	US 40 between Cooks Lane and US 1/Fulton Ave *	6.8	7.3	7.1	7.6	7.6	8.2	8.2	8.8
	I-83 to Baltimore County *	4.1	4.2	4.1	4.3	4.2	4.4	4.3	4.5
Calvert County	SR 2/4 north of Huntingtown	5.5	6.2	6.1	7.1	7.1	8.4	8.3	9.6
	SR 4 northbound to Anne Arundel Co. line	4.1	4.9	4.6	5.6	5.3	6.7	5.9	7.4
	SR 2 northbound to Anne Arundel Co. line	4.3	4.7	4.6	5.2	5.2	6.0	5.8	6.6
Charles County	US 301 between SR 5 and Waldorf	3.8	4.4	4.2	5.0	4.7	5.8	5.1	6.3
	SR 5 westbound at intersection of US 301	3.8	4.5	4.3	5.2	5.0	6.3	5.7	6.9
	SR 210 at intersection of SR 228 (in PG Co.)	2.8	3.0	2.9	3.2	3.1	3.5	3.3	3.7
	US 301 bridge over Potomac River to Virginia	1.3	1.6	1.6	2.0	1.9	2.5	2.2	2.8
Harford	SR 22 from Aberdeen Blvd to US 40	2.9	3.0	2.9	3.0	3.0	3.1	3.0	3.2
	SR 24 between US 40 and I-95	3.3	3.4	3.4	3.4	3.5	3.6	3.5	3.7
	US 1 between SR 23 and SR 543	3.4	3.5	3.5	3.6	3.6	3.7	3.8	3.9
	I-95 northbound from SR 155 to Cecil Co	2.7	2.7	2.7	2.8	2.8	2.9	2.8	2.9
	I-95 southbound from SR 152 to Baltimore Co	3.1	3.3	3.2	3.4	3.3	3.7	3.5	3.8
Prince George's County	US 50 between US 301 and I-95/495	2.6	2.8	2.7	3.0	3.0	3.3	3.2	3.6
	SR 210 to I-95/495	3.7	4.0	3.9	4.3	4.1	4.7	4.4	5.0
	SR 5 to I-95/495	7.4	8.0	7.7	8.6	8.3	9.5	8.8	10.1
	SR 4 to I-95/495	2.6	2.9	2.9	3.3	3.3	3.8	3.6	4.1
	I-95/495 between SR210 and I-295	3.6	3.9	3.8	4.2	4.0	4.6	4.2	4.8
	I-95 at I-95/495 interchange	5.3	5.7	5.5	6.0	5.8	6.6	6.1	7.0
St. Mary's County	SR 5 thru Newmarket and Hughesvile	2.5	2.9	2.8	3.4	3.2	4.0	3.6	4.3
	Intersection of SR 4 and SR 235	3.3	3.7	3.5	4.0	3.8	4.4	4.0	4.7

Identify the worst segment clearance time to help determine the County Clearance Time

CLEARANCE TIME ESTIMATES

Comparing the Clearance Time and Results

Regional Bottlenecks	Bottleneck Location/ Critical Roadway Segment	Cat 1 Low Occupancy	Cat 1 High Occupancy
Anne Arundel County	US 50 between Annapolis and I-97	3.8	4.1
	I-97 between SR 2 and I-695	3.8	4.0
	SR 295 from I-195 to I-695	4.3	4.5
	SR 10/100 below SR 10 split	4.3	4.5
	SR 2 at intersection of SR 10	3.5	3.8
	SR 2 from Steuart Crnr to Annapolis	6.0	6.4
Baltimore County	I-695 from Southeast Blvd to I-95	7.8	8.0
	I-95 between I-895 and I-695	5.6	5.9
	I-695 and I-83 interchange	3.9	4.1
	I-695 and I-70 interchange	6.4	6.9
	I-70 Westbound from I-695 to Howard Co. line	1.5	1.8
	Francis Scott Key Bridge Southbound	8.1	8.3
	SR 40 westbound from I-695 to City Boundary	5.6	5.9
	SR 150 westbound from I-695 to City Boundary	3.5	3.6
	I-95 to I-695	4.6	4.7

Results worksheet inset for illustration purposes

	Speed of Public Response	Cat 1 Low Occupancy	Cat 1 High Occupancy
Anne Arundel County	Slow	7.5	7.9
	Medium	6.0	6.4
	Fast	4.3	4.7
Baltimore County	Slow	10.3	10.5
	Medium	8.1	8.3
	Fast	6.1	6.3

DEMONSTRATION II

This instructor-led demonstration should take 10 minutes to complete

Participants will build skills navigating the ATM and locating and interpreting the results

Instructors will walk through the demonstration using the ATM to answer each question

Participants are encouraged to ask questions during the demonstration

Remember – Work from the copy of the ATM

EXERCISE I

This participant exercise should take 20 minutes to complete

Participants will be expected to navigate the full ATM and to answer the exercise questions on their own

Instructors will monitor participant progress and provide assistance only as needed

Remember - Work from the copy of the ATM saved as

"MD ATM Exercise I"

UNIT 5 – CAPSTONE QUIZ

Identify which module includes information about the total number of evacuees or vehicles for a County

Identify which other worksheets are affected if changes are made in the Out Route Assignment Module

Explain how the clearance times at regional and local bottlenecks are used to determine a County clearance time

UNIT 5 – SUMMARY

The Evacuation Statistics module includes summary information on the total number of evacuating people and vehicles for a County

Changes made in the Out Route Assignment Module also reflected in the three worksheet that make up the Evacuating Vehicles Module; the Evacuating Vehicles by Bottleneck/Critical Roadway Segment, the Clearance Time, and the Results worksheet.

The least efficient (worst) clearance time at regional or local bottlenecks along a county's primary evacuation routes determines its

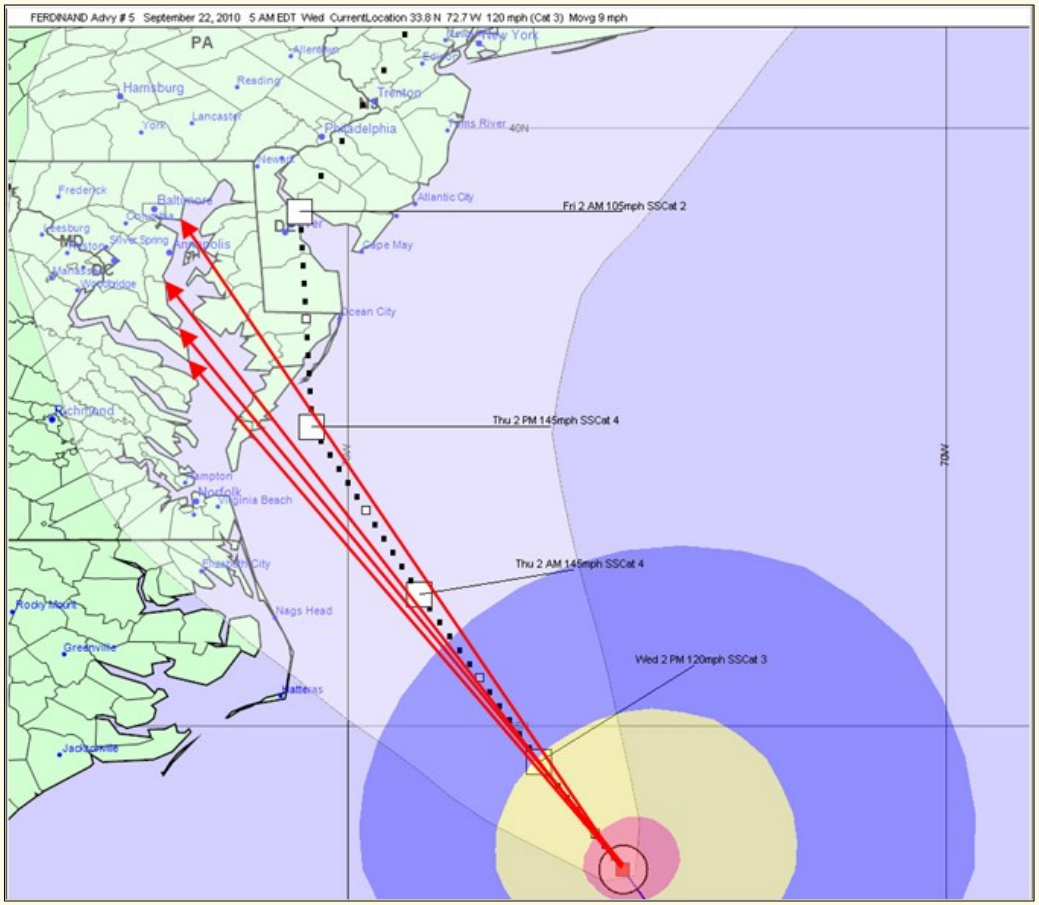
UNIT 6

Using ATM clearance time results in HURREVAC

EXERCISE II

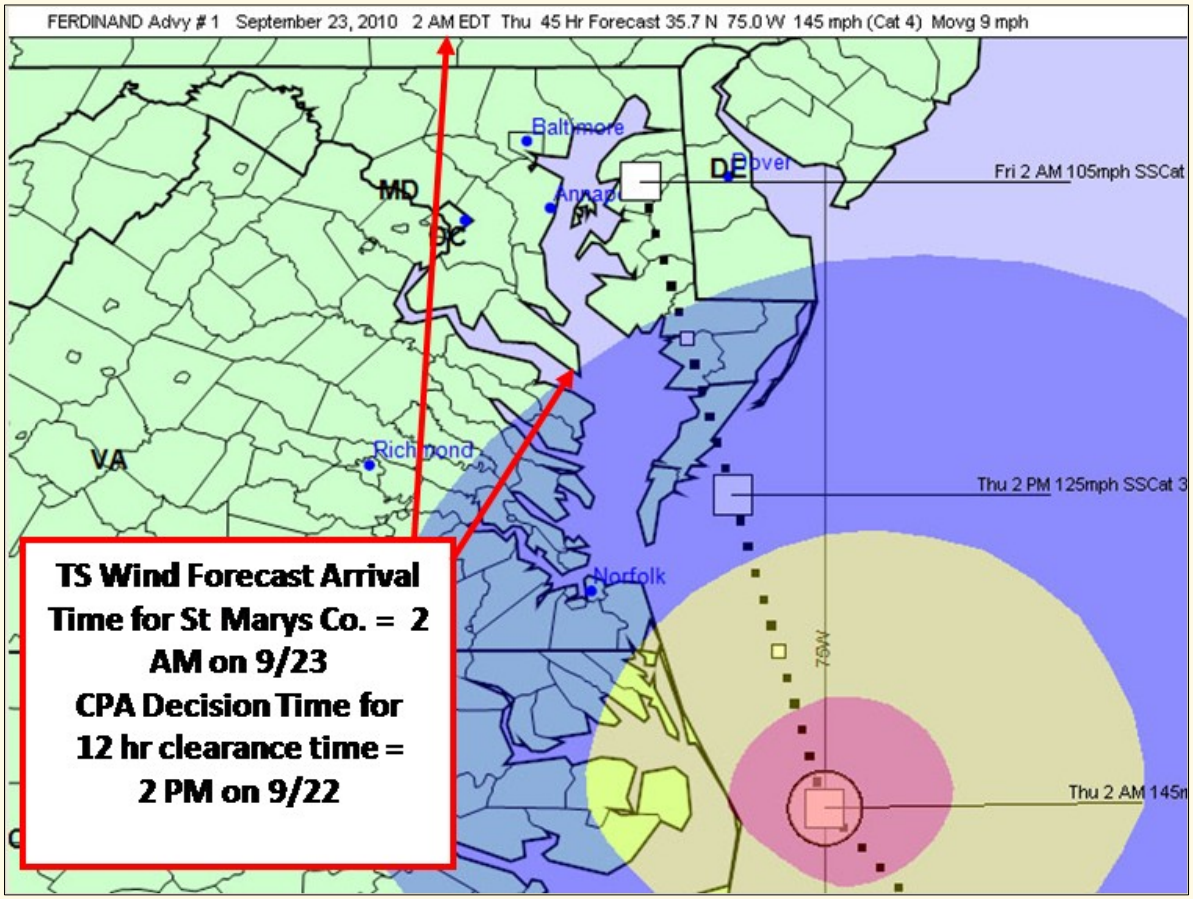
DIRECT TO POINT

Direct to Point (DTP)
Evacuation Timing Assumptions



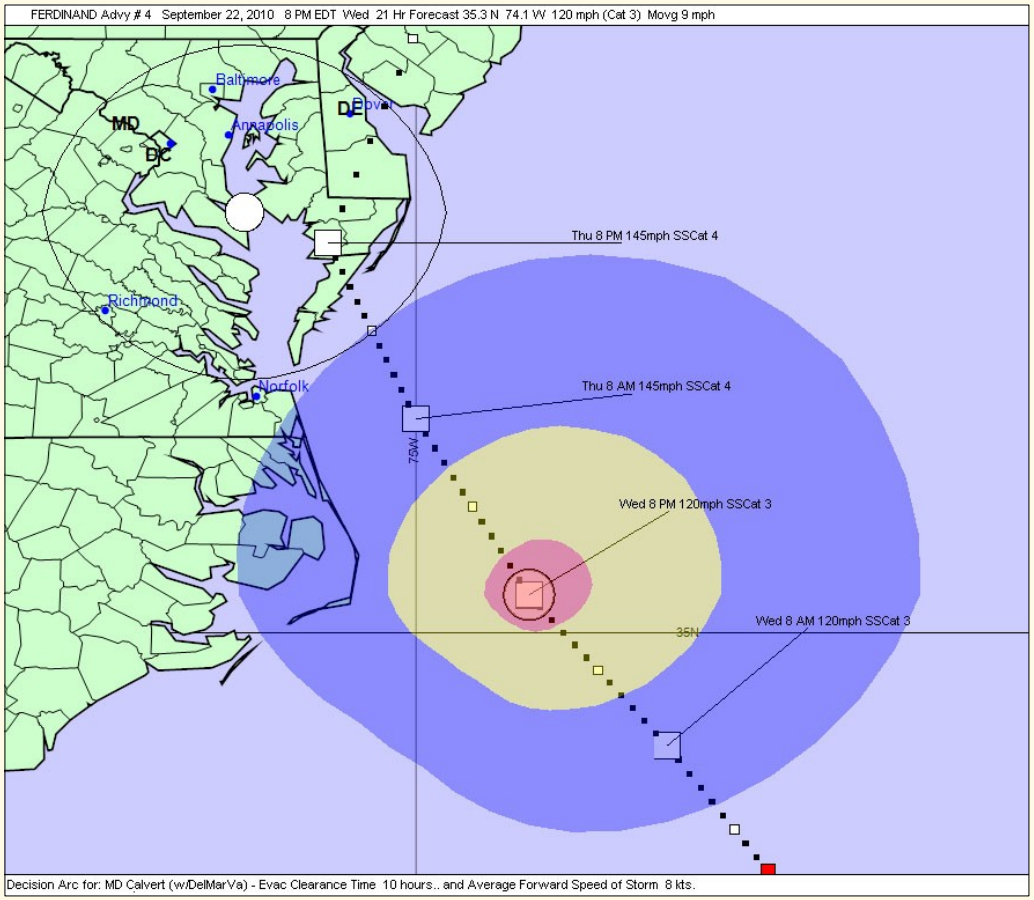
CLOSEST POINT OF APPROACH

Closest Point of Approach (CPA) Evacuation Timing Assumptions


FERDINAND Advy # 1 September 23, 2010 2 AM EDT Thu 45 Hr Forecast 35.7 N 75.0 W 145 mph (Cat 4) Movg 9 mph
Baltimore
MD
DC
DE
Dover
Annapolis
Fri 2 AM 105mph SSCat
VA
Richmond
Thu 2 PM 125mph SSCat 3
Norfolk
75W
Thu 2 AM 145m
TS Wind Forecast Arrival Time for St Marys Co. = 2 AM on 9/23
CPA Decision Time for 12 hr clearance time = 2 PM on 9/22

DECISION ARC

Decision Arc
Evacuation Timing Assumptions


FERDINAND Advy # 4 September 22, 2010 8 PM EDT Wed 21 Hr Forecast 35.3 N 74.1 W 120 mph (Cat 3) Movg 9 mph
Baltimore
Annapolis
MD
DC
DE
Richmond
Norfolk
Thu 8 PM 145mph SSCat 4
Thu 8 AM 145mph SSCat 4
Wed 8 PM 120mph SSCat 3
Wed 8 AM 120mph SSCat 3
75W
35N
Decision Arc for: MD Calvert (w/DelMarVa) - Evac Clearance Time 10 hours.. and Average Forward Speed of Storm 8 kts.

EXERCISE II

This participant exercise should take 10 minutes to complete

Participants will be expected to navigate ATM and integrate its results into the HURREVAC

Participants will use the ATM data to determine the timing of initiating hurricane evacuations in relation to forecast tropical storm wind arrival times

Remember - Work from the copy of the ATM saved as

UNIT 6 – CAPSTONE QUIZ

Identify the two major assumptions relative to evacuation decision timing and the approach of the storm

Use the tools in HURREVAC to determine when to start an evacuation based on the DTP assumption

Use the tools in HURREVAC to determine when to determine start an evacuation based on the CPA assumption

UNIT 6 – SUMMARY

There are two methods to determining the evacuation decision time for a community based on the ATM clearance times.

The DTP assumption relative to the storm approach provides the safest results in calculating a decision time for a community, especially if it is in the average forecast error cone.

The CPA methodology for evacuation decision making assumes that a hurricane will follow along the forecast track in an advisory.

Many of the ATM clearance times are pre-loaded into HURREVAC for use in decision making by state and local emergency management staff.

Despite the pre-loaded clearance times in HURREVAC,

UNIT 7

Course Summary

REVIEW OF UNITS – UNIT 2

The Draft 2009 MD Western Shore HES / TDR provides estimates of clearance times and includes an ATM

The seven steps in the evacuation modeling process include;

Step 1: Establish Evacuation Zones
Step 2: Establish Evacuation Roadway Network
Step 3: Collect Demographic and Behavioral Data
Step 4: Generate Evacuation Statistics
Step 5: Distribute Evacuation Trips
Step 6: Identify Vehicles by Roadway Segment
Step 7: Calculate Clearance Times

Clearance time is the time between when the first person leaves their home until the last person reaches their destination. It includes mobilization time, travel time and queuing time delay. Evacuations must be completed prior to tropical storm force (39 mph) winds

REVIEW OF UNITS – UNIT 3

The Excel-based platform is assessable and easy to use. The model provides reliable results and allows users to test different scenarios.

The six functional groupings of worksheets or modules include;

Demographic Data Module (8 jurisdictional worksheets - *7 counties, 1 city*)

Behavioral Data Module (8 worksheets)

Out Route Assignment Module (9 worksheets - 8 jurisdictions, 1 summary sheet)

Shelter Demand and Capacity Module (8 worksheets)

Evacuation Statistics Module (8 worksheets)

Evacuating Vehicles Module (Vehicles by Road, Clearance Times, Results)

The clearance time table is consulted to identify the regional bottlenecks with the worst clearance times. If a significant portion of a County's evacuating traffic

REVIEW OF UNITS – UNIT 4

While the three primary data entry modules; Socioeconomic, Behavioral, and Out Route Assignment, can all be modified by users, the Socioeconomic Data would most likely be accessed to adjust for common changes such as population growth

The Clearance Time worksheet may be adjusted to account for changes in service volumes on critical roadway segments as well as for anticipated background traffic

REVIEW OF UNITS – UNIT 5

The Evacuation Statistics module includes summary information on the total number of evacuating people and vehicles for a County

Changes made in the Out Route Assignment Module also reflected in the three worksheet that make up the Evacuating Vehicles Module; the Evacuating Vehicles by Bottleneck/Critical Roadway Segment, the Clearance Time, and the Results worksheet.

The least efficient (worst) clearance time at regional or local bottlenecks along a county's primary evacuation routes determines its

REVIEW OF UNITS – UNIT 6

There are two methods to determining the evacuation decision time for a community based on the ATM clearance times.

The DTP assumption relative to the storm approach provides the safest results in calculating a decision time for a community, especially if it is in the average forecast error cone.

The CPA methodology for evacuation decision making assumes that a hurricane will follow along the forecast track in an advisory.

Many of the ATM clearance times are pre-loaded into HURREVAC for use in decision making by state and local emergency management staff.

Despite the pre-loaded clearance times in HURREVAC,

PARTICIPANT OBSERVATIONS

What are your thoughts?

- Did the course meet your objectives?
- Was the course structure well?
- Do you feel prepared to use the ATM?
- Can you train others in its use?

COURSE EVALUATION

Participant observations and feedback will be collected for inclusion in a Workshop Evaluation Report

The course will be evaluated using the web-based evaluation tool, Survey Monkey

Participants will be provided with a web link to complete the evaluation on line

Instructors will prepare an evaluation report including a list of attendees, description of obstacle, keys to success and a compilation of evaluation survey results

CLOSING

Close out of the ATM application and HURREVAC

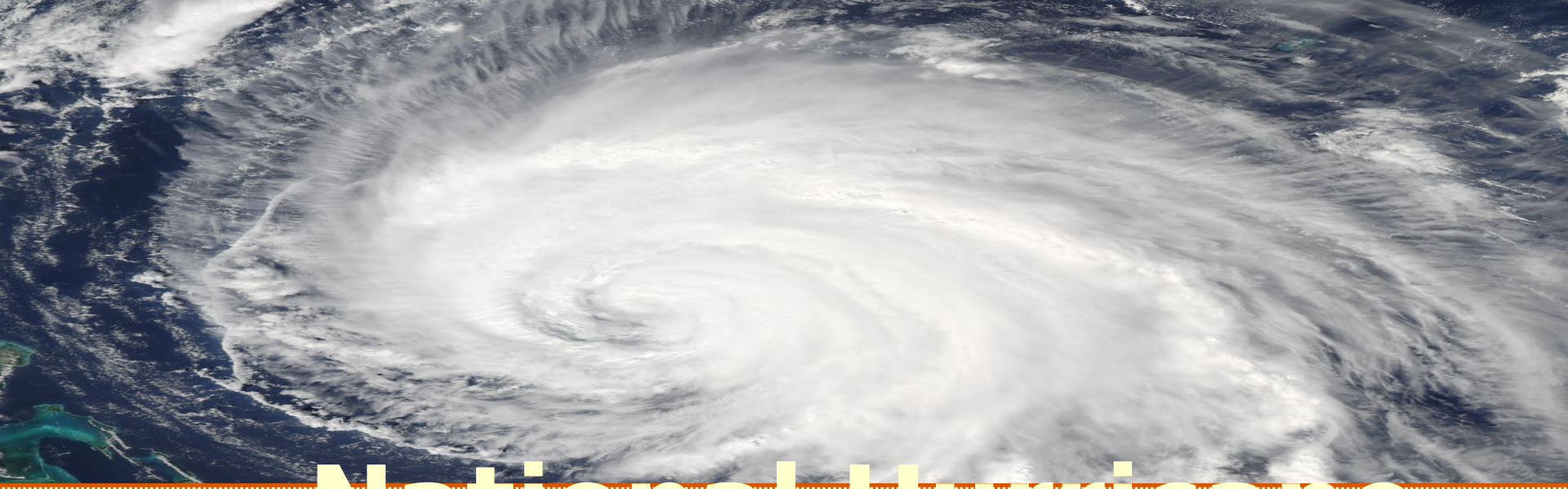
Ensure you were registered on the sign in sheet

Complete the web-based evaluation

Retain all participant course materials

Use the ATM in your emergency management planning and operations duties

Train others in its use



National Hurricane Program

FEMA